

EXPLANATION OF SIGNIFICANT DIFFERENCE**ENVIRO-CHEM SUPERFUND SITE
ZIONSVILLE, INDIANA****I. Introduction**

The Enviro-Chem Superfund Site (also known as the "Environmental Conservation and Chemical Corporation", or the "ECC", Site) is located in a primarily rural area of Boone County, Indiana, approximately 5 miles north of Zionsville and ten miles northwest of Indianapolis. The Site, which occupies approximately 6.5 acres of land, was placed on the National Priorities List ("NPL") for site cleanup in September 1983.

The U.S. Environmental Protection Agency ("U.S. EPA") and the Indiana Department of Environmental Management ("IDEM") have jointly overseen cleanup activities at the Enviro-Chem Site under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §9601, *et seq.* U.S. EPA and IDEM entered into a Consent Decree with certain potentially responsible parties ("PRPs") who agreed to perform the final remedy for the Site. That Consent Decree was approved by the U.S. District Court for the Southern District of Indiana on September 10, 1991. The Consent Decree requires those PRPs to implement the remedy selected by U.S. EPA (with IDEM's concurrence) in a September 25, 1987, Record of Decision ("ROD") and a June 7, 1991, ROD Amendment. That Consent Decree and accompanying documents will be modified, to the extent necessary, to reflect the remedy changes described in this Explanation of Significant Differences ("ESD").

The PRPs have begun designing and implementing the final remedy for the Site under U.S. EPA and IDEM oversight. During this process, newly developed information has persuaded U.S. EPA and IDEM that certain technical modifications and improvements to the selected remedy are appropriate. Section 117(c) of CERCLA and Section 300.435(c)(2)(I) of the National Oil and Hazardous Substances Contingency Plan establish procedures for explaining, documenting, and informing the public of significant changes to the remedy that occur after the ROD is signed. An ESD is required when the remedial action to be taken differs significantly from the remedy selected in the ROD but does not fundamentally alter that remedy with respect to scope, performance or cost. This ESD and supporting documentation shall become part of the administrative record file which is available for viewing at the Zionsville Town Hall (110 South 4th Street) and at the U.S. EPA regional offices in Chicago, Illinois (77 W. Jackson Blvd. 7th floor), during normal business hours. U.S. EPA will also publish a public notice of this ESD in the Zionsville Times-Sentinel, establishing a 30 day public comment period on the ESD. Upon the close of the public comment period, U.S. EPA will prepare a summary of the comments received and a response to those comments. If U.S. EPA determines it is appropriate, U.S. EPA may withdraw or modify this ESD based on public comments.

II. Background

A. Site History

Enviro-Chem began operations in 1977 and was engaged in the recovery, reclamation, and brokering of primary solvents, oils and other wastes received from industrial clients. Waste products were received in drums and bulk tankers and prepared for subsequent reclamation or disposal.

Accumulation of contaminated stormwater on-site, poor management of the drum inventory, and several spills caused State and U.S. EPA investigations of Enviro-Chem. The State pursued Enviro-Chem for violations of the Environmental Management Act, the Air Pollution Control Law, and the Stream Pollution Control Law, resulting in a July 1981, Consent Decree approved by the Boone County Circuit Court. That Court imposed a civil penalty against Enviro-Chem and placed Enviro-Chem into receivership. In May 1982, Enviro-Chem was ordered by the court to close and environmentally secure the Site for failure to reduce hazardous waste inventories. By August 1982, Enviro-Chem was found to be insolvent.

U.S. EPA proposed the Enviro-Chem Site for the NPL in December 1982 and the Site was placed on the list in September 1983. A Remedial Investigation ("RI") was conducted in 1983 and 1984 which involved an investigation of the nature and extent of contamination in soil, groundwater, surface water and sediments on and around the Enviro-Chem Site. A Feasibility Study ("FS") was completed in 1986, which evaluated several alternatives for cleaning-up the Enviro-Chem Site and the neighboring Northside Landfill Site, which had also been placed on the NPL.

Surface contaminants were removed from the Enviro-Chem Site in an operation extending from March 1983 through 1984. These cleanup efforts were initiated by U.S. EPA and completed by a group of PRPs, overseen by U.S. EPA and IDEM, pursuant to a Consent Decree entered on November 9, 1983. Actions included removal and treatment or disposal of cooling pond waters, approximately 30,000 drums of waste, 220,000 gallons of hazardous waste from tanks, 5,650 cubic yards of contaminated soil and cooling pond sludge.

In March 1985, contaminated water was discovered ponded on the concrete pad at the southern end of the Enviro-Chem Site. During the resulting emergency action, U.S. EPA constructed a sump at the southeast corner of the Site, and removed and disposed of 20,000 gallons of contaminated water containing high levels of volatile organics.

B. Record of Decision

A ROD was issued by U.S. EPA on September 25, 1987, selecting a combined remedy for the Enviro-Chem Site and the neighboring Northside Sanitary Landfill Site. That ROD provided

for an impermeable cap over the contaminated areas and a groundwater extraction and treatment system.

Based on a treatability study performed by the PRPs, U.S. EPA and IDEM later determined that it would be feasible and preferable to actively treat the contaminant source at the Enviro-Chem Site, rather than simply containing these materials as provided for in the 1987 ROD. U.S. EPA therefore issued Amended RODs in July, 1991, establishing separate, complementary remedial approaches for the Enviro-Chem and Northside Sites.

As amended, the ROD for Enviro-Chem required:

- Access Restrictions: Placement of deed restrictions on the property to prevent future development of the land thereby protecting against direct contact with contaminated soil and groundwater.
- Soil vapor extraction ("SVE"): Construction of a system utilizing injection and extraction trenches to vaporize and extract volatile organic compounds and phenols from contaminated soils. These contaminants would be captured and removed utilizing granular activated carbon. The goal of the soil vapor extraction system is to clean the soil contamination source areas to cleanup levels that would assure long-term protection of groundwater and surface water.
- RCRA Compliant Cap and Surface Controls: Construction of a multi-layered cap over the entire Site. The cap would comply with Resource Conservation and Reclamation Act ("RCRA") performance-based standards. (The presence of the cap would also improve the efficiency of the soil vapor extraction system by reducing the amount of air and vapor that could escape from that system.) Surface controls include re-routing of the unnamed ditch west of Enviro-Chem to keep surface waters further away from contaminated soil areas and demolition and disposal of deteriorated on-Site buildings.
- Contingent Groundwater Treatment: In the event the soil vapor extraction system did not achieve soil cleanup standards within a five year operation period, or if at that time surface water or groundwater samples still showed unacceptable levels of contamination, groundwater extraction and treatment would be required. Collected groundwater would be treated to meet effluent standards before discharge into Finley Creek. Groundwater extraction and treatment would continue until cleanup standards were met.

C. Subsequent Events

U.S. EPA and IDEM entered into a Consent Decree with certain PRPs under which those PRPs agreed to perform (under U.S. EPA and IDEM supervision) the final remedy for the ECC Site described in the Amended ROD. That Consent Decree was entered September 10,

1991.

Since that time, the PRPs have, under U.S. EPA and IDEM supervision: (1) conducted a Supplemental Investigation in January, 1993, to collect groundwater data needed to design dewatering and treatment facilities associated with the SVE system; (2) obtained the necessary access agreements in July, 1993, with the site owners to permit cleanup of contaminated areas and support activities on adjacent property; (3) completed site preparation work in the Fall of 1993 (with final supplemental work in the Spring of 1994), including an upgrade of site fencing, removal of site structures and debris, decontamination and disposal of tanks, construction of pads for future decontamination and storage activities, site grading and construction of drainage channels; (4) from September, 1994, through January 22, 1996, secured, inventoried, analyzed and removed drums of contaminated material that had accumulated on-site during previous investigations and response activities; and (5) submitted a 90% design for completion of the remedial action on December 19, 1991 which the parties recognized (in light of circumstances described below) required substantial revision, submitted a new 30% design plan for review and comment in July, 1994, submitted a revised 30% design plan in January, 1995, submitted a 90% design plan on October 27, 1995, and submitted a draft 100% design on September 26, 1996.

During the course of these activities, the PRPs encountered several difficulties. Solutions to these difficulties have been developed jointly by the PRPs, U.S. EPA and IDEM. These solutions will affect the remedy and have led to the changes described in this ESD. First, during the January, 1993, Supplemental Investigation, the PRPs identified nine organic compounds in site groundwater that had not been identified at levels of concern in the Remedial Investigation (and thus did not have cleanup standards in the ROD). The parties discussed and agreed to a mechanism for establishing appropriate cleanup standards for certain of these additional compounds.

Second, the Supplemental Investigation also showed that the water table at the southern end of the site was higher than it was during the SVE pilot test conducted in 1987, and was high enough that it could be expected to hamper the effectiveness of SVE in that area. In response to this data, the PRPs evaluated other options for addressing contamination in the southern end of the site and presented this evaluation to U.S. EPA and IDEM.

Third, during excavation activities conducted as part of the site preparation work (both in preparing the drainage channels and in preparing the decontamination pad), contamination was encountered to the west of the approximate western site boundary identified in the ROD and the Consent Decree. This required the PRPs to conduct additional sampling along a portion of the western boundary of the site to better determine the nature and extent of contamination in that area. (The PRPs had planned to use this area as part of the "Central Support Zone" for storage and movement of equipment and materials for the remedy.) The PRPs conducted their Central Support Zone Investigation in July, 1995.

Fourth, further researching SVE technologies in preparing the design, the PRPs learned that: (1) SVE technology developments made it possible that extraction wells might prove to be as effective, or more effective, than the extraction trenches specified in the Amended ROD; (2) on-site activities to operate and maintain the SVE system would likely damage the integrity of the RCRA cap, requiring potentially difficult repairs and suggesting that use of an interim cap could still improve the effectiveness of SVE and be upgraded to a full RCRA cap after SVE was complete; (3) SVE contractors possess specialized and sometimes proprietary information on extraction processes that are necessary to a complete design but would not be available until after a SVE contractor is selected based on an initial design, an approach that was somewhat inconsistent with the procedures described in the 1991 Consent Decree.

Fifth, Central Support Zone Investigation data indicated that the organic carbon content of site soils was generally higher than was assumed in the model used to set soil cleanup levels in the ROD Amendment. That model calculated the rate at which contamination in the soil would be transferred to groundwater as groundwater flowed through the Site. Using that model, U.S. EPA calculated cleanup standards that would reduce soil contamination to levels that would be protective of groundwater. The site-specific data on the organic carbon content of site soils indicated that a slightly higher level of contamination in the soil would likely remain adsorbed to the soil rather than carried along with the groundwater than was originally predicted. As a result of this new information, U.S. EPA and IDEM agreed to make minor revisions to the model and the cleanup standards to reflect the actual site conditions. Since cleanup standards were going to be revised, U.S. EPA and IDEM also agreed to add a minor change in the cleanup standard for 1,1-Dichloroethane ("DCA"). The change in the DCA cleanup standard was based on information about the cancer potency of DCA developed since the time of the 1991 ROD Amendment. Since that time, a general scientific consensus has developed that concludes DCA does not pose the level of cancer risk previously believed. As a result, the risk calculation and cleanup standard for DCA were re-calculated to reflect this information.

III. Significant Differences

As a result of the new information developed and the difficulties encountered after the Amended ROD was signed, U.S. EPA (in consultation with IDEM) has made four significant changes to the Enviro-Chem ROD as amended in 1991. The PRPs have agreed to these changes and they will be incorporated in an amendment to the 1991 Consent Decree and revisions to Exhibits A and B of that Decree describing the work to be performed at the Site.

1. Excavation of Southern Portion of Site:

The PRPs conducted an SVE treatability study in 1988. That study persuaded U.S. EPA and IDEM that SVE would be an appropriate method for source remediation across the Enviro-Chem Site. However, during pre-design studies and site preparation work, it has been observed that groundwater elevations at the southern area of the Site, in the area of the concrete pad, have shown consistent levels at or very near the ground surface. Pondered water

on and around the concrete pad has been noted on numerous occasions as a result, in part, of high water table elevations. It is assumed that very dry weather conditions in 1988 (when the SVE treatability study was conducted) resulted in a lower than normal water table elevation and thereby created temporarily favorable conditions for the SVE method in the southern concrete pad area. Because SVE is significantly less effective in saturated soils, and because SVE system construction in saturated soils would significantly increase engineering difficulties and costs, U.S. EPA and IDEM agreed to consider another method for remediating soils in the southern portion of the Site.

At U.S. EPA's direction, the PRPs prepared an evaluation of alternatives to SVE for the southern area of the Site. Based on that evaluation, U.S. EPA (with IDEM's concurrence) has adopted an alternative approach to the southern area soil contamination. U.S. EPA believes this approach will be more effective than SVE for this area in addressing subsurface contamination.

In order to remediate soils in the southern portion of the Site, soils beneath the concrete pad will be excavated to a depth of 9 feet. (This is the depth to which SVE was originally expected to be effective.) Sheet pilings will be used in the eastern portion of this area to reduce the amount of water that will seep into the excavated area. When the 9 foot depth is reached, any remaining visible contamination will also be excavated and any contamination of concern identified through field screening may also be excavated. All water accumulated in the excavation area will be collected, characterized, treated to meet discharge standards and appropriately disposed of through discharge to an on-site surface water body. Confirmatory soil samples will be collected and the excavation will also be backfilled with clean soil from an off-site borrow source. The concrete pad overlying this area will be crushed and excavated with the underlying soil. The excavated soils and crushed concrete will then be moved to the northern area of the Site where SVE will be performed on the soil and crushed concrete. An impermeable cap which complies with RCRA Subtitle C standards will be placed over the excavated area unless the confirmatory sampling shows that the excavation produced the equivalent of a clean closure (i.e., no detectable contamination) under RCRA.

2. Additional Cleanup Standards and Revised Cleanup Standards:

In 1993, groundwater sampling at the Enviro-Chem Site detected nine organic compounds for which the ROD and ROD Amendment had not established cleanup standards. After evaluating this data, U.S. EPA, IDEM and the PRPS agreed to add cleanup standards for three of these contaminants in this ESD and in a revision to the 1991 Consent Decree. These contaminants are: vinyl chloride, 1,2-dichloroethene (total) and 1,2-dichlorobenzene. As with the other soil cleanup standards in the ROD and the Consent Decree, soil cleanup standards for these compounds are calculated using a model intended to assure that ground and surface water potentially impacted by contamination at the Site would satisfy Maximum Contaminant Levels ("MCLs"), or if no MCLs exist for a particular compound, Lifetime Drinking Water Health Advisory ("LDWhA") standards or risk-based standards. These MCLs, LDWhAs and risk-

based standards also apply to on-site groundwater. Surface water cleanup standards for these compounds are based on State water quality standards. These additional contaminants and their cleanup standards are listed in Table 1.

In the course of evaluating and establishing cleanup standards for these additional contaminants, U.S. EPA, IDEM and the PRPs identified another factor that led to a minor additional correction of the prior cleanup standards. The original model calculated soil cleanup standards using a literature reference value for the organic carbon fraction for the type of soils expected to be found in this area of Indiana. In November 1995, the PRPs collected an additional 79 soil samples from 16 boring locations on-site. The results of this sampling event provided a site-specific organic carbon fraction to be used in the model for calculating soil cleanup standards. The use of a site-specific organic carbon value resulted in an adjustment in the soil cleanup standards for most soil contaminants (see Table 1 for revised cleanup standards).

Following the approach used in the ROD Amendment, the re-calculated soil cleanup standard for each compound (including the nine additional compounds detected in the 1993 groundwater sampling) were then compared to actual observed levels of that compound in site soils. Each compound that has been observed in site soils at levels above the soil cleanup standard and/or has been observed in groundwater at levels above the groundwater cleanup standard is listed in Table 1. These cleanup standards therefore address the compounds which currently pose an unacceptable risk to groundwater (and surface water) at the Site. The standards will be enforceable under the revised Consent Decree. Under this approach, the recalculation of cleanup standards led to the removal of chlorobenzene, chloroform and 1,1-DCA¹ from the table as well as the addition of vinyl chloride, 1,2-dichloroethene (total) and 1,2-dichlorobenzene to the table. If the SVE system is successful in reducing the compounds listed in Table 1 to their soil cleanup levels, it will also have succeeded in reducing significantly the concentration of the other organic compounds which are now present at lower levels in the site soils.

A body of toxicological evidence gathered since the cleanup standards were developed in 1989-90 indicates that the toxicity of 1,1-Dichloroethane ("DCA") is dramatically less than was assumed several years ago. This is a unique development with an unusually dramatic impact on the potential health risks posed by that compound. Ordinarily, site cleanup standards are "frozen" at the time a ROD is issued. This approach provides certainty to the parties and the public and avoids the distraction of repeated requests for marginal changes based on new scientific studies. Because U.S. EPA and IDEM were already reconsidering the cleanup standards in light of the math error and revision in soil organic carbon content in the underlying model, it was deemed appropriate to adjust the DCA model assumptions to reflect these significant scientific developments.

3. RCRA-Compliant Cap:

As stated above, soils and crushed concrete from the southern area of the Enviro-Chem Site will be excavated and moved to the northern portion of the Site. Once this material is placed and graded properly, a surface cover will be placed over this area. This cover will consist of a minimum of 3 feet of compacted, impermeable native soil and 1 foot of top soil to support vegetation. This cover will still help to facilitate the proper operation of the SVE system. This interim cover can readily be repaired, restored and maintained when affected by vehicle and equipment traffic which are used during SVE operation. If the entire cap, including synthetic liner were placed over the remediation area at the outset, these operational activities might jeopardize the integrity of that liner. Thus, the final cover will not be put in place until after the success or failure of the soil cleanup, using SVE, is verified. The final cover will consist of a geocomposite drainage net placed on top of the originally placed soil layer described above; the final cover will therefore be essentially identical to the cover described in the Amended ROD. This final cover will extend over the excavated area on the southern end of the Site unless confirmatory sampling shows the excavation achieved the equivalent of a clean closure under RCRA. A minimum of 1 foot of soil and 1 foot of topsoil will be placed on top of the drainage net. The drainage net will have a minimum transmissivity of 0.01 ft²/sec.

4. Re-drawn Remediation Boundary:

In response to unexpected contamination found during site preparation work and longstanding U.S. EPA concerns, additional soil sampling was conducted in 1995, in the area of the Site originally labeled as the Central Support Zone ("CSZ") which is located along the Site's western edge. This sampling effort determined that soils in part of the CSZ are contaminated at levels posing a threat to human health and the environment. The CSZ is contaminated with the same compounds found on other areas of the Enviro-Chem Site. In order to address this additional contaminated zone, the boundary for remediation has been re-drawn by agreement, as shown in attached Figure 1. SVE will also be conducted in this zone and the same cleanup standards as detailed in Table 1 (including the cleanup standards for the additional three compounds as described above) will apply. Contamination exists to the west of the remediation boundary, but it is expected that SVE may successfully address this contamination as well. Sampling will be conducted in the area beyond the revised remediation boundary after SVE is completed. If the post-SVE sampling finds that contamination of concern remains in this area, EPA may require further response action. Such further cleanup would, however, not be covered by the existing Consent Decree.

Finally, although it does not alter the substance of the remedy, it is worth noting briefly a change to the design review process described in the Consent Decree. In order to improve the quality and specificity of the final SVE design, U.S. EPA (in consultation with IDEM) will review and approve an initial SVE design that leaves some flexibility for SVE contractors to shape the specific details of the process. The SVE contractor selected by the PRPs will assist

them in preparing a more detailed design which will be submitted to the Agencies for final approval. This approach also allows for the possibility that an SVE contractor and the PRPs may persuade the Agencies that use of SVE wells is preferable to the SVE trenches required in the ROD. If trenches will not be used, U.S. EPA will issue another ESD to reflect and explain such a change in the remedy.

IV. Affirmation of Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the selected remedy, U.S. EPA believes (and IDEM concurs) that the remedy as modified in this ESD remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective.

In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.

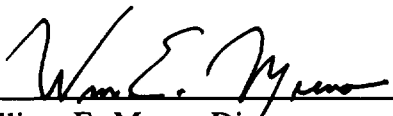
V. State Comment

IDEM concurs with the modifications made by U.S. EPA in this ESD. A letter of concurrence from IDEM, received by U.S. EPA on March 17, 1997, is attached.

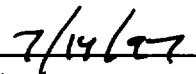
VI. Public Participation Activities

U.S. EPA published a public notice of this ESD in the Zionsville Times-Sentinel, informing interested persons that a copy of the ESD and supporting documentation was available at the Zionsville Town Hall (110 South 4th Street) and at the U.S. EPA regional offices in Chicago, Illinois (77 W. Jackson Blvd. 7th floor), during normal business hours. That notice established a 30 day public comment period on the ESD beginning May 1, 1997, and ended May 30, 1997. No comments were received.

VII. Concurrence



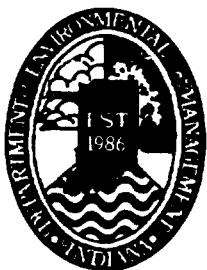
William E. Munro, Director
Superfund Division



Date

**SUMMARY OF COMMENTS RECEIVED DURING THE MAY, 1997, PUBLIC
COMMENT PERIOD AND U.S. EPA RESPONSES TO THESE COMMENTS.**

No comments were received.



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live

Frank O'Bannon
Governor

Michael O'Connor
Commissioner

100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
Telephone 317-232-8603
Environmental Helpline 1-800-451-6027

RECEIVED
MAR 17 1997

SUPERFUND DIVISION
OFFICE OF THE DIRECTOR

Mr. William E. Muno
Director, Superfund Division
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Muno:

Re: Explanation of Significant Difference to the
Record of Decision for the
Enviro-Chem Superfund Site

The Indiana Department of Environmental Management (IDEM) has reviewed the U.S. Environmental Protection Agency's Explanation of Significant Difference to the the Record of Decision for this site. The IDEM is in full concurrence with the changes made by the document.

The significant changes to the selected remedy include:

- Excavation of the southern portion of the site;
- Additional cleanup standards and revised cleanup standards;
- RCRA-compliant cap;
- Re-drawn remediation boundary.

Our staff has been working very closely with Region V staff in the selection of an appropriate remedy and is satisfied that these significant differences will adequately protect the public health, welfare and the environment in regard to the Enviro-Chem site.

Please be assured that the IDEM is committed to accomplishing the remediation of all Indiana sites on the National Priorities List and intends to fulfill all obligations required by law to achieve that goal.

Sincerely,

Michael O'Connor
Commissioner

MO:AWL:tl
cc: Mr. Tony Likins, IDEM-OER

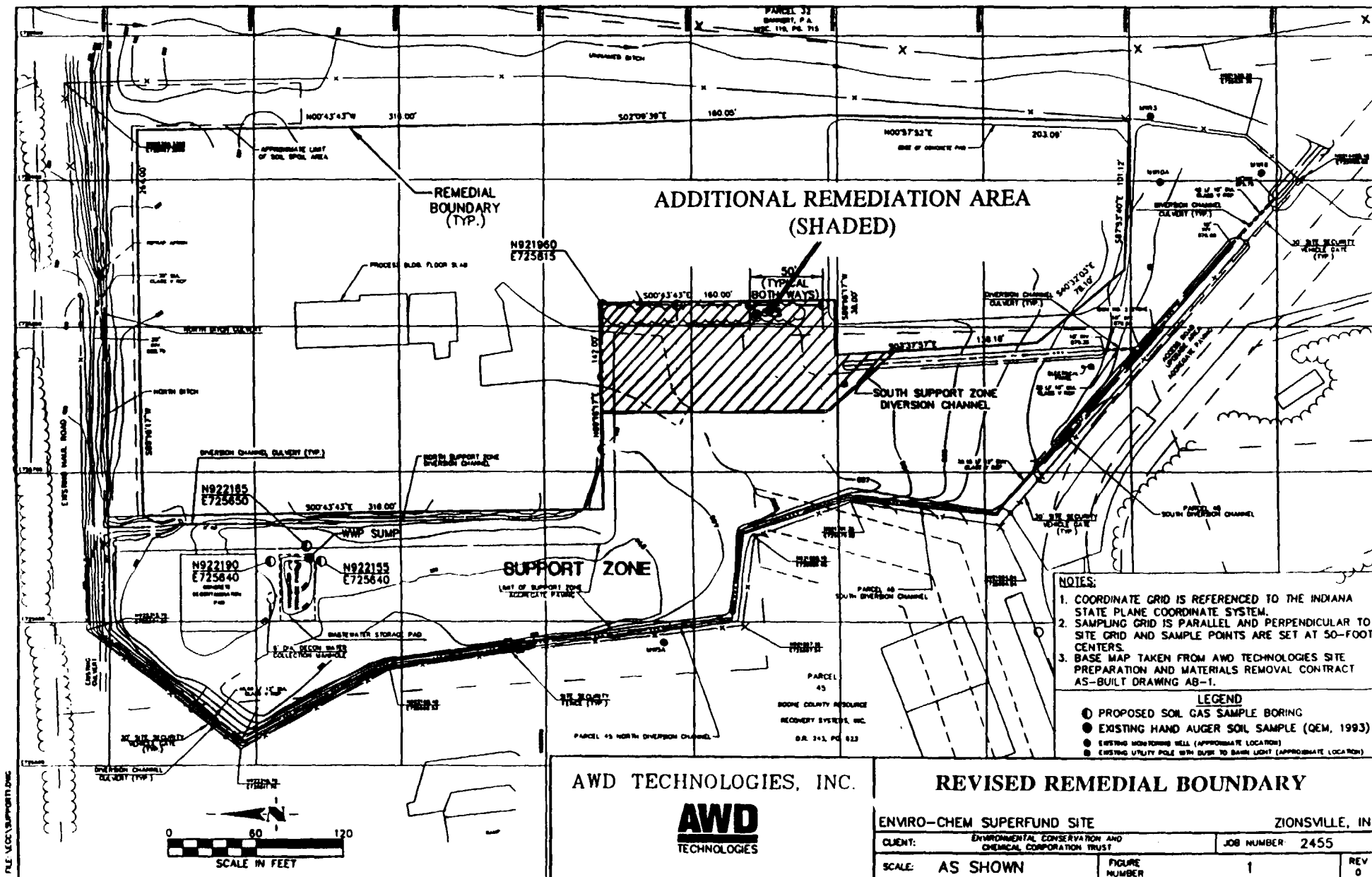


TABLE 1
REVISED CLEANUP STANDARDS

ENVIROCHEM SUPERFUND SITE
ZIONSVILLE, INDIANA

(Page 1 of 4)

Parameter	Acceptable Subsurface Water Concentration ^{1,2} (ug/L)	Acceptable Stream Concentration ^{3,4} (ug/L)	Acceptable Soil Concentration ^{3,6} (ug/kg)
Volatile Organic Compounds			
Acetone	3,500 RB		2,196
1,1-Dichloroethene	7 MCL	1.85	762
1,2-Dichloroethene(total) *	70 MCL	1.85	5,782
Ethyl benzene	680 MCL	3,280	207,464
Methylene chloride	4.7 RB	15.7	126
Methyl ethyl ketone	170 LDWHA		352
Methyl isobutyl ketone	1,750 RB		18,200
Tetrachloroethene	0.69 RB	8.85	77
Toluene	2,000 MCL	3,400	546,134
1,1,1-Trichloroethane	200 MCL	5,280	47,871
1,1,2-Trichloroethane	0.61 RB	41.8	71
Trichloroethene	5 MCL	80.7	812
Vinyl chloride	2 MCL	525	8.3
Total Xylenes	10,000 MCL		5,596,192
Semivolatile Organic Compounds			
bis(2-ethylhexyl)phthalate	2.5 RB	50,000	
Di-n-butyl phthalate	3,500 RB	154,000	
1,2-Dichlorobenzene *	600 MCL	763	370,160
Diethyl phthalate	28,000 RB	52,100	
Isophorone	8.5 RB		
Naphthalene	14,000 RB	620	
Phenol	1,400 RB	570	51,680

* = new compound (not included in original Consent Decree)

TABLE 1
REVISED CLEANUP STANDARDS

ENVIROCHEM SUPERFUND SITE
ZIONSVILLE, INDIANA

(Page 2 of 4)

Parameter	Acceptable Subsurface Water Concentration ^{1,2} (ug/L)	Acceptable Stream Concentration ^{3,4} (ug/L)	Acceptable Soil Concentration ^{5,6} (mg/kg)
Inorganics			
Antimony	14 RB		
Arsenic	50 MCL	0.0175	
Barium	1,000 MCL		
Beryllium	4 MCL		
Cadmium	10 MCL		
Chromium VI	50 MCL	11	
Lead	50 MCL	10	
Manganese	7,000 RB		
Nickel	150 LDWHA	100	
Silver	50 MCL		
Tin	21,000 RB		
Vanadium	245 RB		
Zinc	7,000 RB	47	
Cyanide	154 LDWHA	5.2	
Polychlorinated biphenyls	0.0045 RB (7)	0.000079 (7.8)	

Notes:

¹ RB = Risk-based standard. U.S. EPA, Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), December 1991.

EPA = Letter from Michael McAteer of United States Environmental Protection Agency to the Enviro-Chem Trustees, October 12, 1995.

MCL = Drinking water Maximum Contaminant Level. 40 CFR 141

LDWHA = Lifetime drinking water health advisory. U.S. EPA, Superfund Public Health Evaluation Manual update of November 16, 1987.

TABLE 1
REVISED CLEANUP STANDARDS

ENVIROCHEM SUPERFUND SITE
ZIONSVILLE, INDIANA

(Page 3 of 4)

Notes: (continued)

² In the event that higher concentrations than those set forth for any parameter in this column are present in the upgradient subsurface water in the till and/or sand and gravel according to the procedure specified below, then those higher upgradient subsurface water concentrations and not the values set forth in this table shall constitute the Acceptable Subsurface Water Concentrations within the meaning of this Exhibit A and the Consent Decree. Those upgradient subsurface water concentrations are referred to in this Exhibit A as "Applicable Subsurface Water Background Concentrations." Twelve subsurface water samples will be taken from existing or new well locations, approved by EPA, over at least a 12-month period in areas upgradient of the site. The exact procedure, location of wells, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the state, prior to its implementation. Subsurface samples for inorganics and PCB analysis will be filtered. For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all nondetects will be assigned a value equal to 1/2 the EPA-approved quantification limit. For purposes of this Document, "Applicable Subsurface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples.

³ Stream Criteria, from Table 1 of the Record of Decision for the site, September 25, 1987 (or calculated on the same basis).

⁴ In the event that higher concentrations than those set forth for any parameter in this column are present in the upstream surface water, then those higher upstream concentrations and not the values set forth in this table shall constitute the Acceptable Stream Concentrations within the meaning of this Exhibit A and the Consent Decree. Those higher upstream surface water concentrations are referred to in this Exhibit A as "Applicable Surface Water Background Concentrations." Twelve surface water samples will be taken from Unnamed Ditch upstream of the site over at least a 12 month period. The exact procedure, location of samples, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the state, prior to its implementation. For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all nondetects will be assigned a value equal to 1/2 the EPA- approved quantification limit. For purposes of this document, "Applicable Surface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples.

⁵ Acceptable Soil Concentration is based on ingestion of subsurface water at the site boundary, assuming a dilution of leachate to subsurface water of 1:196 (Appendix B).

TABLE 1
REVISED CLEANUP STANDARDS

ENVIROCHEM SUPERFUND SITE
ZIONSVILLE, INDIANA

(Page 4 of 4)

Notes: (continued)

- ' The Acceptable Soil Concentrations, within the meaning of this Exhibit A and the Consent Decree, will be achieved when the arithmetic average of the soil sample results for each parameter, assigning all nondetect results a value of 1/2 the detection limit, do not exceed the values set forth in this table by more than 25%.
- ' So long as the EPA-approved quantification limit for PCBs in water is above the acceptable subsurface water and stream concentrations for PCBs, compliance with the Acceptable Subsurface and Stream Concentrations for PCBs will be determined as follows: all subsurface and surface water sample results for PCBs must be below the EPA-approved quantification limit for PCBs (at the time compliance is determined).
- ' Modified from Superfund Public Health Evaluation Manual, October, 1986, EPA 4/540/1-86/060, OSWER Directive 9285.4 1.
- ' Revised Site-Specific Acceptable Soil Concentrations were calculated in accordance with the procedures in Appendix B of Exhibit A using updated Acceptable Subsurface Water Concentrations (shaded) and the f_{α} value corresponding to the 90% lower confidence limit of the mean of the TOC values from the TOC Investigation.

ORIGINAL CLEANUP STANDARDS
(Taken from 1991 Consent Decree)

ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION (ECC) SITE

Compounds	Acceptable Subsurface Water Concentration (1,2) (ug/l)	Acceptable Stream Concentration (3,4) (ug/l)	Acceptable Soil Concentration (5,6) (ug/kg)
VOLATILE ORGANICS (VOCs):			
Acetone	3,500 RB		490
Chlorobenzene	60 MCLGP		10,100
Chloroform	100 MCL	15.7	2,300
1,1-Dichloroethane	0.38 RB		5.7
1,1-Dichloroethene	7 MCL	1.85	120
Ethylbenzene	680 MCLGP	3,280	234,000
Methylene Chloride	4.7 RB	15.7	20
Methyl Ethyl Ketone	170 LDMA		75
Methyl Isobutyl Ketone	1,750 RB		8,900
Tetrachloroethene	0.69 RB	8.85	130
Toluene	2,000 MCLGP	3,400	238,000
1,1,1-Trichloroethane	200 MCL	5,280	7,200
1,1,2-Trichloroethane	0.61 RB	41.8	22
Trichloroethene	5 MCL	80.7	240
Total Xylenes	440 MCLGP		195,000
BASE NEUTRAL/ACID ORGANICS:			
Bis(2-ethylhexyl)phthalate	2.5 RB	50,000	
Di-n-Butyl Phthalate	3,500 RB	154,000	
Diethyl Phthalate	28,000 RB	52,100	
Isophorone	8.5 RB		
Naphthalene	14,000 RB	620	
Phenol	1,400 RB	570	9,800
INORGANICS:			
Antimony	14 RB		
Arsenic	50 MCL	0.0175	
Barium	1,000 MCL		
Beryllium	175 RB		
Cadmium	10 MCL		
Chromium VI	50 MCL	11	
Lead	50 MCL	10	
Manganese	7,000 RB		
Nickel	150 LDMA	100	
Silver	50 MCL		
Tin	21,000 RB		
Vanadium	245 RB		
Zinc	7,000 RB	47	
Cyanide	154 LDMA	5.2	
PESTICIDES/PCBs:			
PCBs	0.0045 RB (7)	0.000079 (7,8)	

ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION (ECC SITE)

NOTES:

- (1) RB = Risk-based standard. U.S. EPA, Draft RCRA Facility Investigation Guidance, 1987.
- MCL = Drinking water Maximum Contaminant Level. 40 CFR 141
- MCLGP = Drinking water MCL goal, proposed. U. S. EPA Superfund Public Health Evaluation Manual, update of November 16, 1987.
- LDWHA = Lifetime drinking water health advisory. U.S. EPA, Superfund Public Health Evaluation Manual, update of November 16, 1987.
- (2) In the event that higher concentrations than those set forth for any parameter in this column are present in the upgradient subsurface water in the till and/or sand and gravel according to the procedure specified below, then those higher upgradient subsurface water concentrations and not the values set forth in this table shall constitute the Acceptable Subsurface Water Concentrations within the meaning of this Exhibit A and the Consent Decree. Those upgradient subsurface water concentrations are referred to in this Exhibit A as "Applicable Subsurface Water Background Concentrations." Twelve subsurface water samples will be taken from existing or new well locations, approved by EPA, over at least a 12 month period in areas upgradient of the site. The exact procedure, location of wells, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the State, prior to its implementation. Subsurface samples for inorganics and PCB analysis will be filtered. For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all non-detects will be assigned a value equal to 1/2 the EPA-approved quantification limit. For purposes of this Document, "Applicable Subsurface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples.
- (3) Stream Criteria, from Table 1 of the Record of Decision for the site, September 25, 1987.
- (4) In the event that higher concentrations than those set forth for any parameter in this column are present in the upstream surface water, then those higher upstream concentrations and not the values set forth in this table shall constitute the Acceptable Stream Concentrations within the meaning of this Exhibit A and the Consent Decree. Those higher upstream surface water concentrations are referred to in this Exhibit A as

"Applicable Surface Water Background Concentrations." Twelve surface water samples will be taken from Unnamed Ditch upstream of the site over at least a 12 month period. The exact procedure, location of samples, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the State, prior to its implementation. For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all non-detects will be assigned a value equal to 1/2 the EPA-approved quantification limit. For purposes of this Document, "Applicable Surface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples.

(5) Acceptable Soil Concentration is based on ingestion of subsurface water at the site boundary, assuming a dilution of leachate to subsurface water of 1:196 (Appendix B).

(6) The Acceptable Soil Concentrations, within the meaning of this Exhibit A and the Consent Decree, will be achieved when the arithmetic average of the 20 soil sample results for each parameter, assigning all non-detect results a value of one-half the detection limit, do not exceed the values set forth in this table by more than 25 percent.

(7) So long as the EPA-approved quantification limit for PCBs in water is above the acceptable subsurface water and stream concentrations for PCBs, compliance with the Acceptable Subsurface and Stream Concentrations for PCBs will be determined as follows: all subsurface and surface water sample results for PCBs must be below the EPA-approved quantification limit for PCBs (at the time compliance is determined).

(8) Modified from Superfund Public Health Evaluation Manual, October, 1986, EPA 4/540/1-86/060, OSWER Directive 9285.4-1.

U.S. EPA ADMINISTRATIVE RECORD
 REMEDIAL ACTION
 ENVIRO-CHEM SUPERFUND SITE
 ZIONSVILLE, INDIANA
 UPDATE #2 - EXPLANATION OF SIGNIFICANT DIFFERENCES
 11/12/96

DOC# =====	DATE =====	AUTHOR =====	RECIPIENT =====	TITLE/DESCRIPTION =====	PAGES =====
1	08/05/91	Scheible, R., ERM-North Central, Inc.	Vendl, K., U.S. EPA	Letter re: Submittal of Project Plans and Specifications	4
2	02/21/92	Vendl, K., U.S. EPA	Bernstein, N., Arent Fox Kinter Plotkin & Kahn; et al.	Letter re: U.S. EPA/IDEM's Comments on the Remedial Action Project Documents	2
3	02/28/92	Bernstein, N., Arent Fox Kinter Plotkin & Kahn	Vendl, K., U.S. EPA	Letter re: (1) Contracting Strategies and (2) Changes to the Consent Decree	3
4	03/00/93	ECC Trust/AMD Technologies, Inc.	U.S. EPA	Phase II Supplemental Investigation Report	138
5	06/03/93	Grow, B., AMD Technologies, Inc.	Vendl, K., U.S. EPA	Letter re: AMD's Response to U.S. EPA's Comments on (1) May 1993 Response to U.S. EPA's Comments on the Pre-Final Design; (2) Supplement to the Comments on the Pre-Final Design; and (3) the Air Monitoring Plan for the SPMR Phase	10
6	07/20/93	State of Indiana/ County of Boone	Settling Defendants	Settlement and Access Agreement	56
7	07/30/93	Vendl, K., U.S. EPA	Grow, B., AMD Technologies, Inc.	Letter re: U.S. EPA's Review and Approval of the Site Preparation and Material Removal Design Documents	2
8	10/11/93	Ball, R., ERM-North Central, Inc.	Vendl, K., U.S. EPA	Letter Forwarding Attached Revised Response Action Conceptual Plan and Associated Schedule	9
9	11/01/93	Vendl, K., U.S. EPA	Dowiak, M., AMD Technologies, Inc.	Letter re: U.S. EPA's Comments on the Proposed Field Changes to the Approved Design of the Site Preparation and Material Removal Phase of the Cleanup	3
10	01/00/94	ECC Trust/AMD Technologies, Inc.	U.S. EPA	Final Report and Certifications: Site Preparation and Material Removal (Volume 1 of 3: Text and Appendices A-G)	433
11	01/00/94	ECC Trust/AMD Technologies, Inc.	U.S. EPA	Final Report and Certifications: Site Preparation and Material Removal (Volume 2 of 3: Appendices H-Q)	706

DOC# =====	DATE =====	AUTHOR =====	RECIPIENT =====	TITLE/DESCRIPTION =====	PAGES =====
26	10/13/94	Bernstein, N., N.W. Bernstein & Associates	Novak, D., U.S. EPA	Letter Forwarding Attached AWD Letter re: Basis for the Establishment of the Western Boundary for the Enviro-Chem Site	35
27	11/00/94	ECC Trust/AWD Technologies, Inc.	U.S. EPA	Drummed Waste Removal Plan	113
28	12/09/94	Novak, D., U.S. EPA	Bernstein, N., N.W. Bernstein & Associates	Letter re: Revised Response Action Report	4
29	12/13/94	Novak, D., U.S. EPA	Bernstein, N., N.W. Bernstein & Associates	Letter Forwarding Attached Information re: Capping the Excavated Southern Area	30
30	12/13/94	Novak, D., U.S. EPA	Bernstein, N., N.W. Bernstein & Associates	Letter re: U.S. EPA's Comments Concerning the Western Boundary	3
31	12/16/94	ECC Trust/AWD Technologies, Inc.	U.S. EPA	Draft Evaluation of Alternatives Memorandum Revised Remedial Action w/Cover Letter	55
32	02/00/95	ECC Trust/Dow Environmental Inc.	U.S. EPA	Central Support Zone Investigation: Field Sampling Plan (Revision 3)	89
33	02/16/95	Novak, D., U.S. EPA	Dowiak, M., Dow Environmental, Inc.	Letter re: Drummed Waste Removal Plan	1
34	02/21/95	Novak, D., U.S. EPA	Dowiak, M., AWD Technologies, Inc.; et al.	Letter re: U.S. EPA's Approval of the Revised Draft Evaluation of Alternatives Memorandum Risk Based Remedial Action	1
35	03/07/95	Smith, R., U.S. EPA	RRC Table Mailing	Memorandum re: January-June, 1995 Risk Based Concentration Table	23
36	06/06/95	Novak, D., U.S. EPA	Dowiak, M., Dow Environmental, Inc.	Letter re: U.S. EPA's Approval, w/ Modifications, of the Central Support Zone Investigation Plan	2
37	08/29/95	Dowiak, M., Dow Environmental, Inc.	McAteer, M., U.S. EPA	Letter re: Status Update on the Drummed Waste Removal Project	11
38	10/02/95	Mahuta, F., CH2M Hill	McAteer, M., U.S. EPA	Memorandum re: CH2M's Review of the PRP Proposed Soil Cleanup Objectives	4
39	10/12/95	McAteer, M., U.S. EPA	Ball, R., c/o N.W. Bernstein & Associates	Letter re: ECC Trustees' Proposal to Revise the Existing Soil Cleanup Standards	3

DOC# =====	DATE =====	AUTHOR =====	RECIPIENT =====	TITLE/DESCRIPTION =====	PAGES =====
40	10/13/95	Bernstein, N., N.W. Bernstein & Associates	McAteer, M., U.S. EPA	Letter re: (1) Revisions to Existing Soil Cleanup Standards; (2) Request for Dispute Resolution; (3) Fate and Transport of Contaminants; (4) Site Specific Carbon Sampling Plan; and (5) Contaminated Soils in the Support Zone	6
41	10/18/95	Dowiak, M., Dow Environmental, Inc.	McAteer, M., U.S. EPA	Letter re: Assessment of Remedial Actions in the Central Support Zone	7
42	12/06/95	McAteer, M., U.S. EPA	Ball, R., et al.; c/o N.W. Bernstein & Associates	Letter re: (1) Change to the DCA Toxicity Factor and Resulting Cleanup Standard; (2) Contamination in the Central Support Zone; (3) Site Specific Organic Soil Carbon Data; and (4) the Dispute Resolution	3
43	12/08/95	McAteer, M., U.S. EPA	Dowiak, M., Dow Environmental, Inc.	Letter re: U.S. EPA's Comments on the Central Support Zone Investigation Report	2
44	01/00/96	ECC Trust/Dow Environmental Inc.	U.S. EPA	Central Support Zone Investigation Report	97
45	01/25/96	ERM-North Central, Inc.	U.S. EPA	Technical Memorandum: Soil Organic Carbon	26
46	03/11/96	McAteer, M., U.S. EPA	Dowiak, M., Dow Environmental, Inc.	Letter re: U.S. EPA's Approval of the Revised Central Support Zone Investigation Report	1
47	03/19/96	Ball, R., ERM-North Central, Inc.	McAteer, M., U.S. EPA	Technical Memorandum re: Rationale for (1) Acceptable Subsurface Water Concentration for Xylenes and (2) Absence of Acceptable Stream Concentration for Beryllium	10
48	04/12/96	Dowiak, M., Radian International	McAteer, M., U.S. EPA	Letter re: Basis of Recommendation for On Site Treatment and Disposal of Wastewater in the Revised Remedial Action Design	5
49	04/12/96	Ball, R., ERM-North Central, Inc.	McAteer, M., U.S. EPA	Technical Memorandum re: Rationale for Modification of the Acceptable Subsurface Water Concentration in Table 3-1 of Exhibit A to the Consent Decree	2
50	04/17/96	ECC Trustees	Krueger, T., U.S. EPA	Memorandum re: U.S. EPA's Proposed Revisions to Exhibit A of the Consent Decree	5